

# Puget Sound Clean Air Agency Project Updates

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# Overview

## Recently Completed:

Air Toxics Study complete

Ceilometer deployment and data display expansions (and still growing)

Annual PM<sub>2.5</sub> Purple Air Kriging

## Underway:

TREE (Trailer for Researching Environmental Equity) Study

Chromium VI Study

Establishing routine ultrafine particle monitoring

# Recently Completed Projects

# Air Toxics Study completed

**Diesel exhaust** continues to “drive” our potential cancer risk in the region (over 80%)

Air toxics have been **cut in half** over the last two decades

Major **roadways** and areas with residential **wood smoke** are most impacted from aldehydes and benzene

**Hexavalent chromium** another contributor in industrial areas

Community-directed sampling for **metals showed low risk**

1-page and 8-page summary:

<https://pscleanair.gov/2023ToxicsSummary>

Full technical report (294 pages):

<https://pscleanair.gov/2023ToxicsReport>



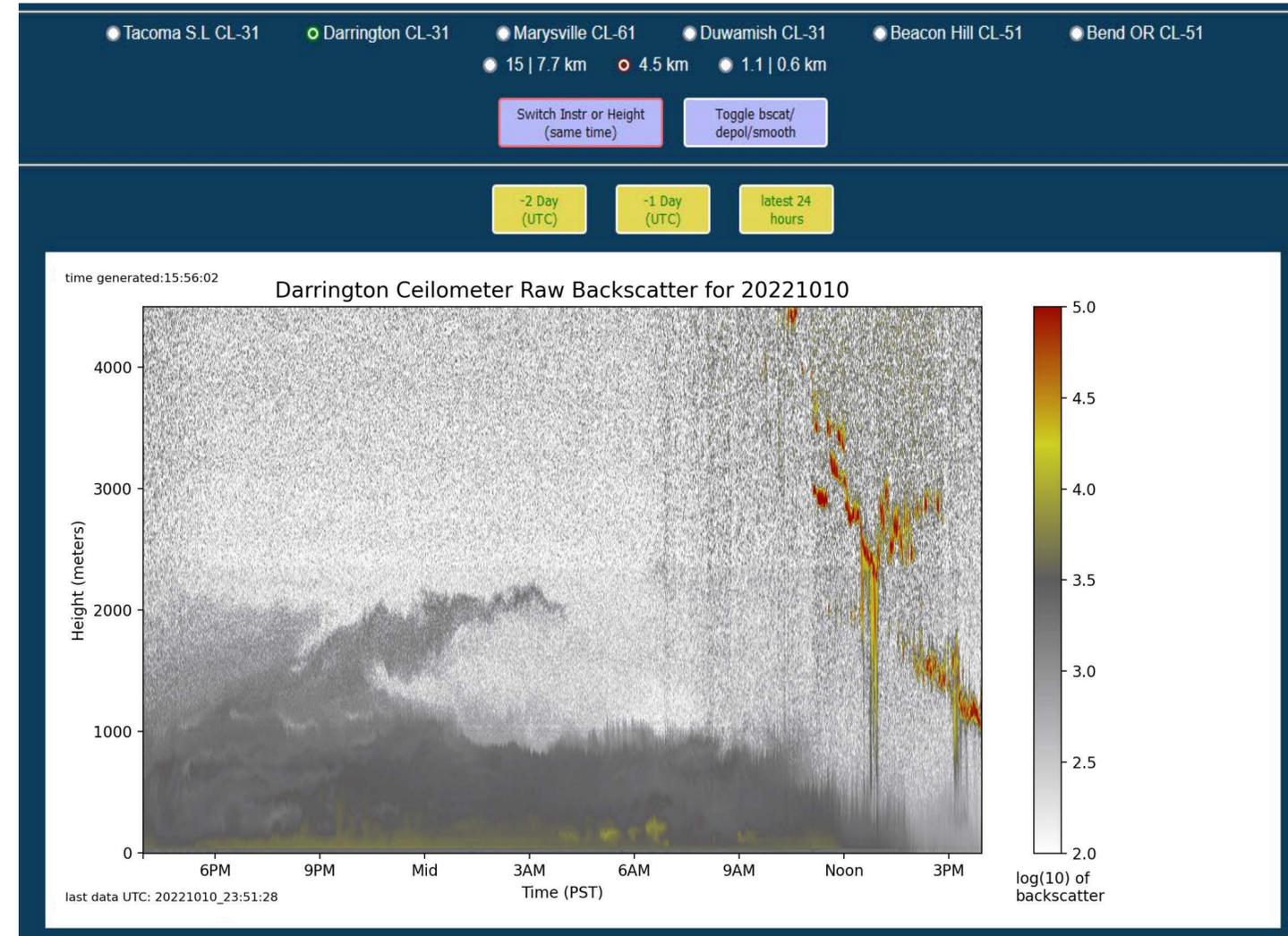
# Ceilometer data platform

<http://apps.pscleanair.gov/Ceil/home.html>

**Five ceilometers in Puget Sound** currently (includes Ecology's one in Beacon Hill)

Now **includes Bend OR** and we expect **more to come online soon**, including NW WA, Portland, and ID

Can **download historical data** with web address variables



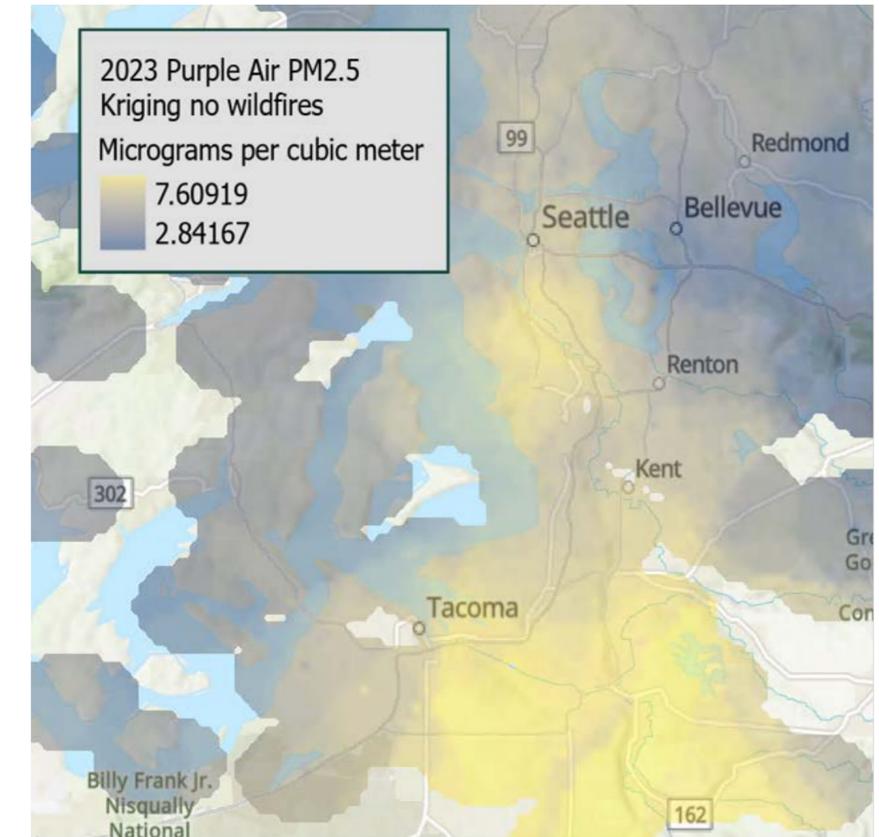
# Annual PM<sub>2.5</sub> Purple Air Kriging

Developed tool to **average fine particles** spatially across Puget Sound

Can **screen out wildfire smoke** marked dates

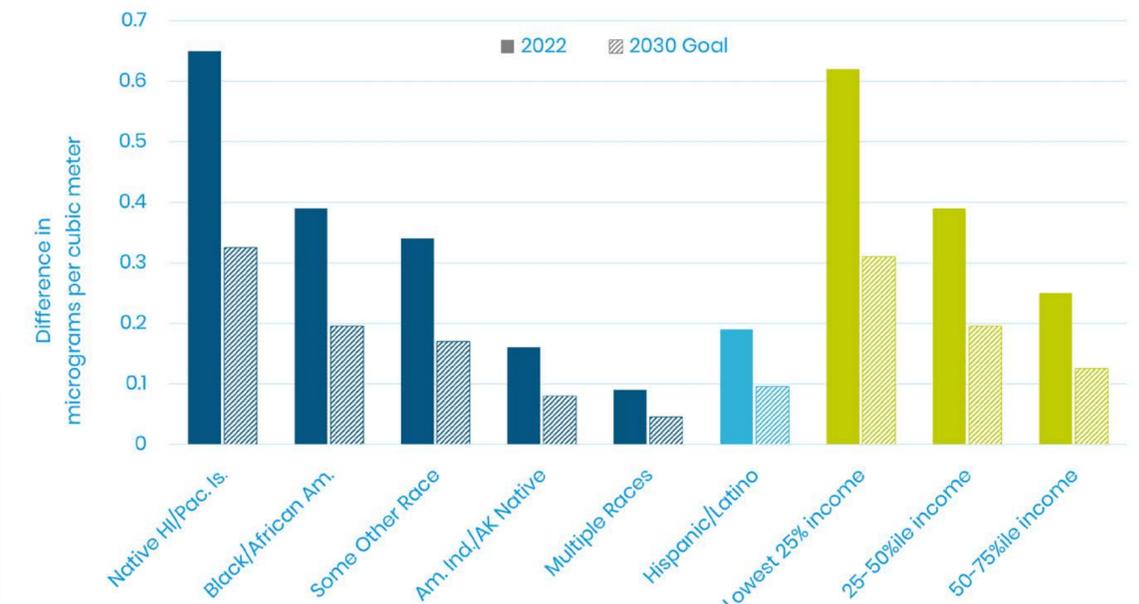
Useful for:

- Starting discussions on **cumulative risk** analyses
- **Tracking equity** progress on Agency goals (disparities cut in half by 2030)<sup>1</sup>
- Can **communicate** general air quality risks



## 3-year average of fine particle differences by race, ethnicity, and income

Compared to White, non-Hispanic/Latino, or highest income quartile



Wildfire smoke days excluded

# Projects Underway

# TREE Study

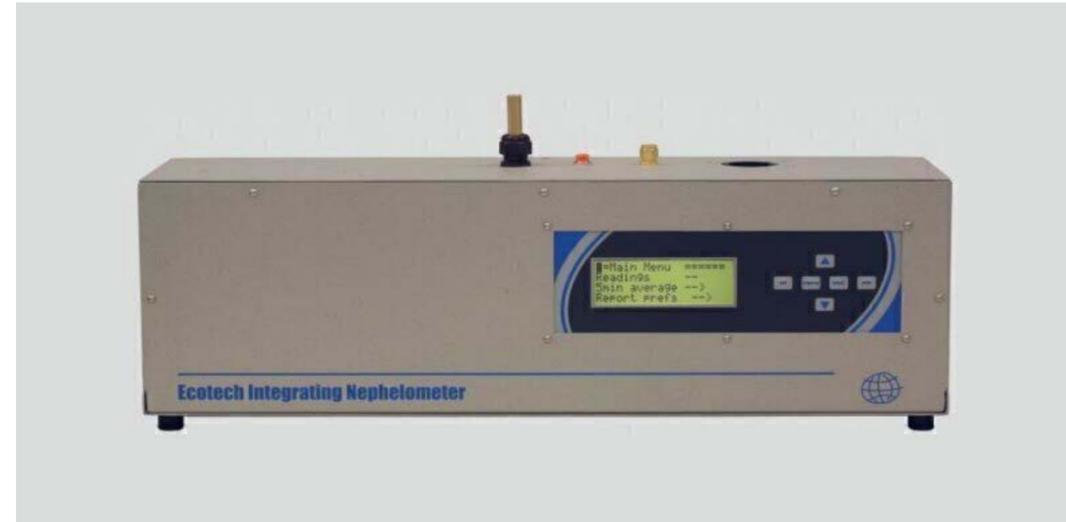


# TREE (Trailer for Researching Environmental Equity) Study



- \$500K EPA grant from Enhanced Air Quality Monitoring for Communities
- 3-year grant (May 2023 – Apr 2026)
- Main objectives are to increase community-directed air monitoring by:
  - Deploying an innovative air monitoring approach using a TREE (Trailer for Researching Environmental Equity) equipped with stationary reference instruments
  - Branching out from the TREE will be community-led air monitoring activities (walking or biking tours, etc.) that will use portable hand-held sensors.

# Instruments in the Trailer



# Community Monitoring Sensors

PM/particle counters



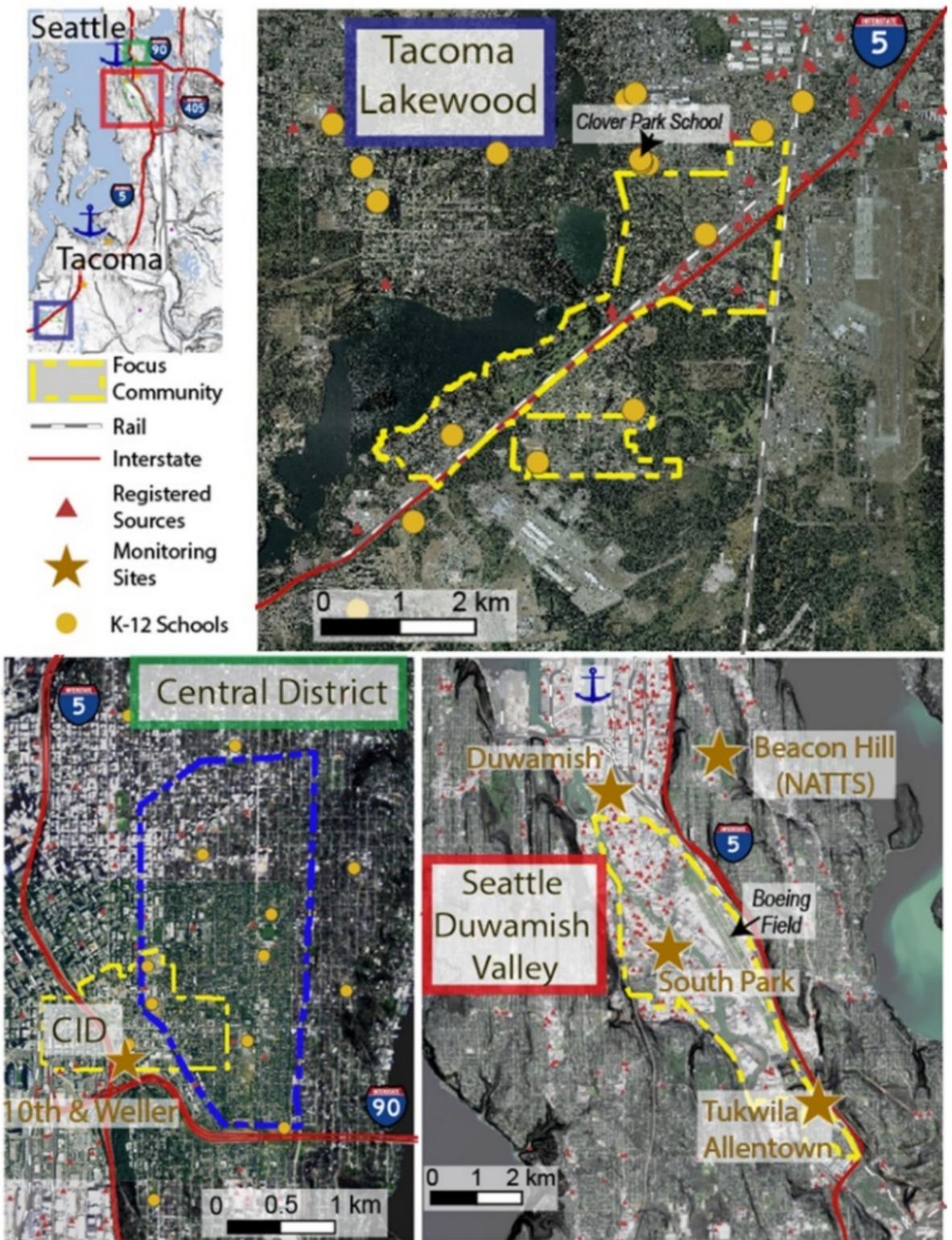
Ultrafines

Black carbon



# Study Locations

- Seattle's Central District
- Seattle's Chinatown-International District
- Seattle's Duwamish Valley
- Lakewood





# Project Partners

- University of Washington
- King County International Airport Community Coalition
- Washington Build Back Black Alliance
- Community Youth Groups
  - Seattle Duwamish - Duwamish Valley Youth Corps
  - Tacoma Lakewood - Wa-Ya Outdoor Institute
  - Chinatown International District - InterimCDA
  - Central District - Rainier Scholars

# Timeline



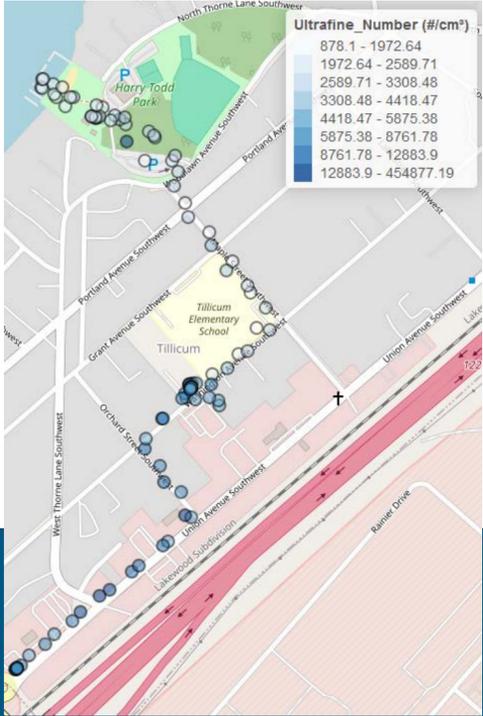
Lakewood  
Listening  
Session and  
study design –  
March 2024

Monitoring  
for Lakewood  
– Apr - Jun  
2024

Monitoring  
for other sites  
– Jul 2024 -  
Feb 2025

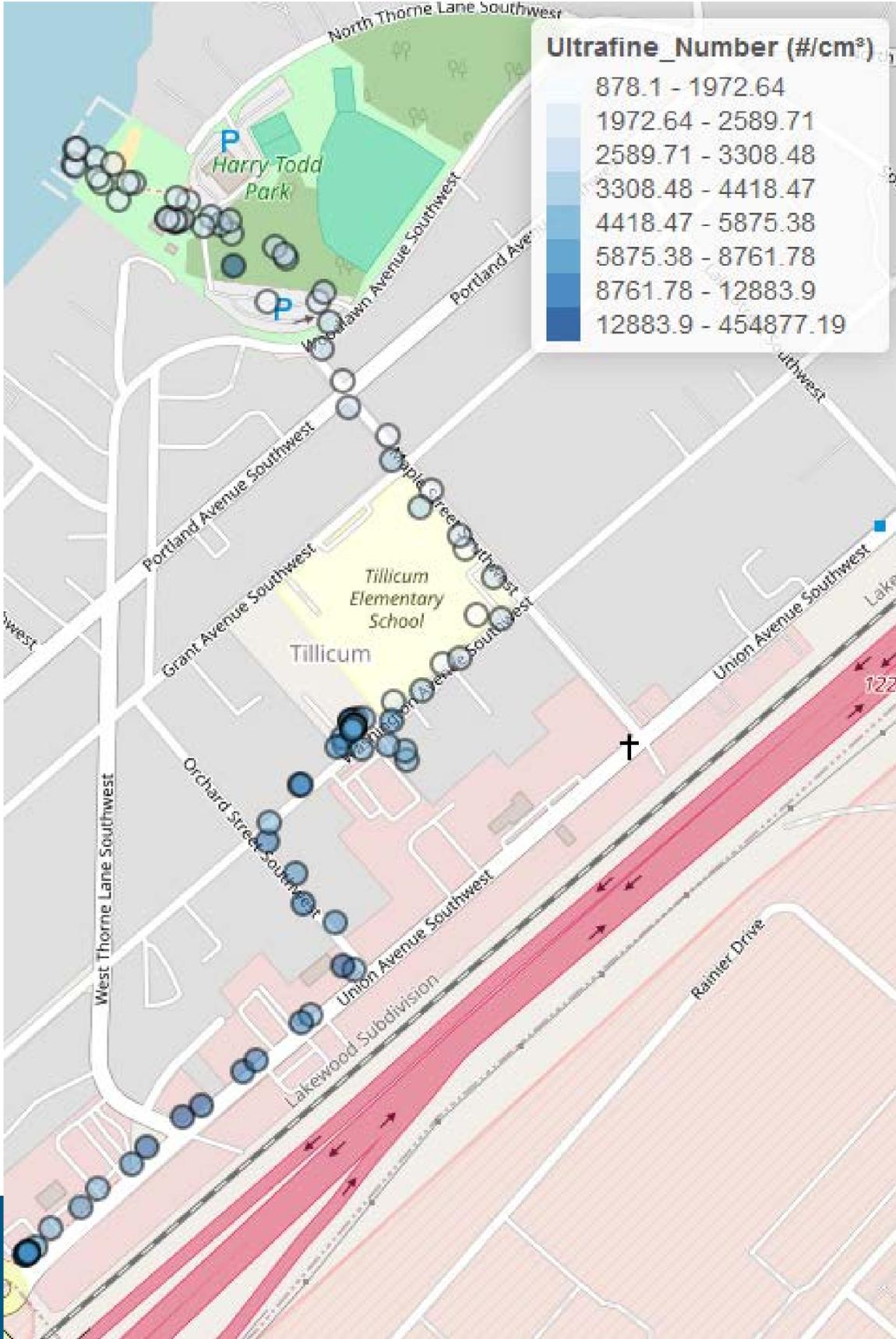
Data Analysis  
– Jul 2024-  
May 2025

Report back  
to community  
– mid 2025



# TREE web app

- Can plot data and show spatial gradients



# Chromium VI Study

\$47K grant via Ecology from additional Section 103 funding expires June 2025

Want to update CrVI/Total Cr ratios to better estimate potential cancer risk values

Will start monitoring in August

Will run two samplers at each site (total chromium and chromium VI)

## Hexavalent chromium and total chromium sampling schedule

Sampling Location	Weeks 1-3	Weeks 4-6	Weeks 7-9
Seattle Duwamish	X	X	X
Tacoma Tideflats	X		
Seattle South Park Residential		X	
Temporary site in the Duwamish Valley			X



# Ultrafine Particle Monitoring – Proviso

Proviso for \$400K from the state legislature, through June 2025

<https://lawfilesexternal.wa.gov/biennium/2023-24/Pdf/Bills/Session%20Laws/Senate/5200-S.SL.pdf> (page 112)

Funds two continuous multi-size binned ultrafine particle counters for:

Near-road site in the Seattle Chinatown-International District (10<sup>th</sup> & Weller St hosted by Ecology)

Near-airport site (likely Sunset Park in SeaTac under the flight paths of Sea-Tac Airport)

Includes analysis by our Agency and University of Washington

Monitoring already began last month at the near-road site

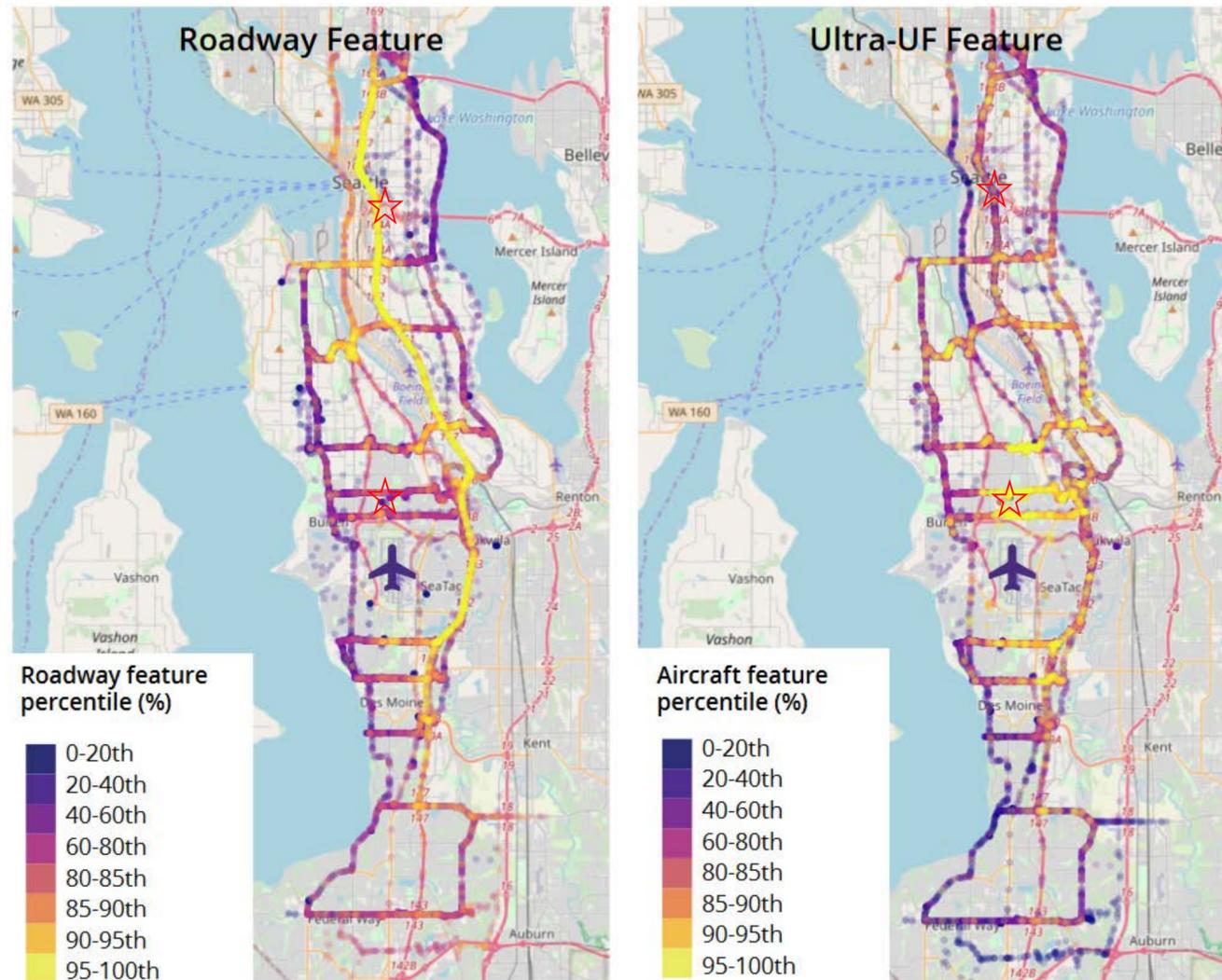


# Ultrafine Particle Monitoring – Background

**Table 3-1. Key causality determinations for PM<sub>2.5</sub> and UFP exposures.**

Health Outcome	Size Fraction	Exposure Duration	2009 ISA	2019 ISA
Mortality	PM <sub>2.5</sub>	Long-term	Causal	Causal
		Short-term		
Cardiovascular effects	PM <sub>2.5</sub>	Long-term	Causal	Causal
		Short-term		
	UFP	Short-term	Suggestive of, but not sufficient to infer	Suggestive of, but not sufficient to infer
Respiratory effects	PM <sub>2.5</sub>	Long-term	Likely to be causal	Likely to be causal
		Short-term		
UFP	Short-term	Suggestive of, but not sufficient to infer	Suggestive of, but not sufficient to infer	
Cancer	PM <sub>2.5</sub>	Long-term	Suggestive of, but not sufficient to infer	Likely to be causal
Nervous System effects	PM <sub>2.5</sub>	Long-term	---	Likely to be causal
		Short-term	Inadequate	Suggestive of, but not sufficient to infer
	UFP	Long-term	---	Suggestive of, but not sufficient to infer
		Short-term	Inadequate	Suggestive of, but not sufficient to infer

# Routine UFP monitoring: UW MOV-UP study context



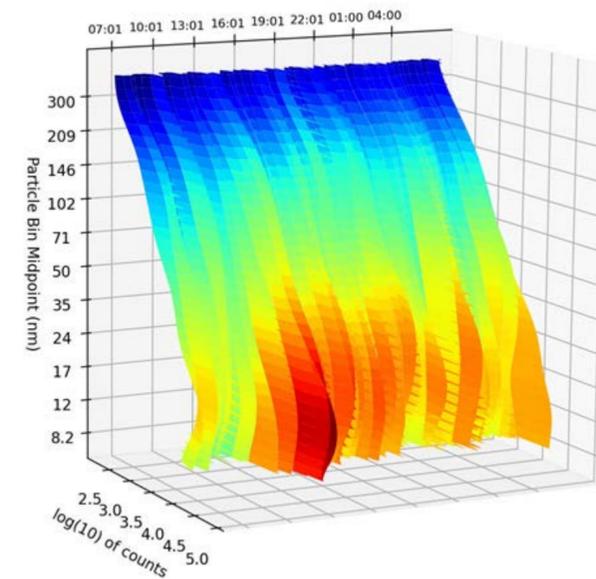
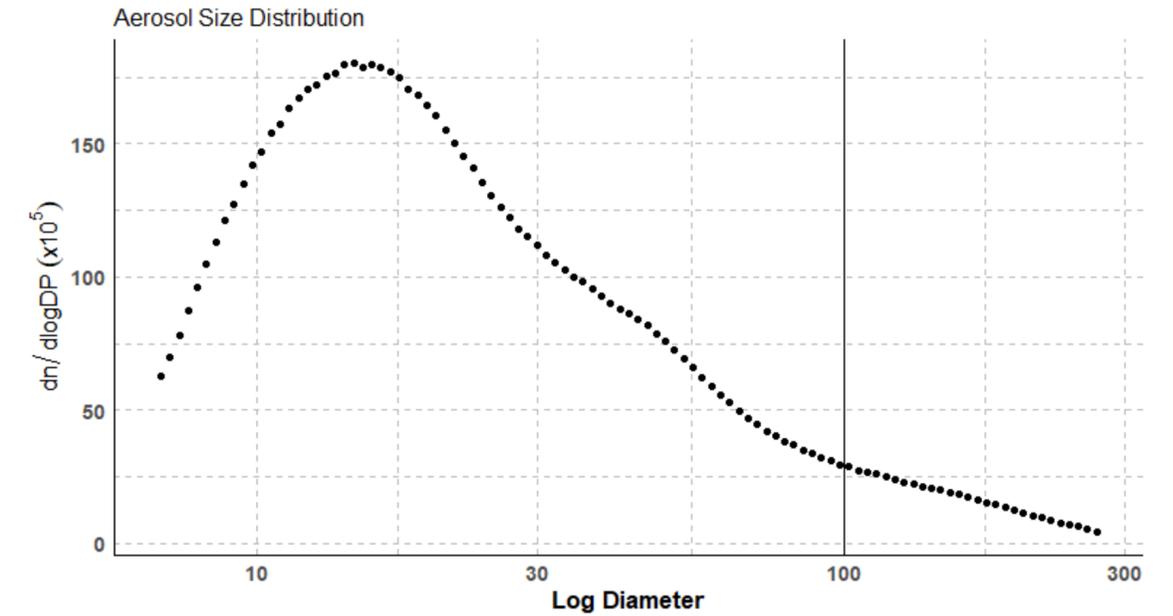
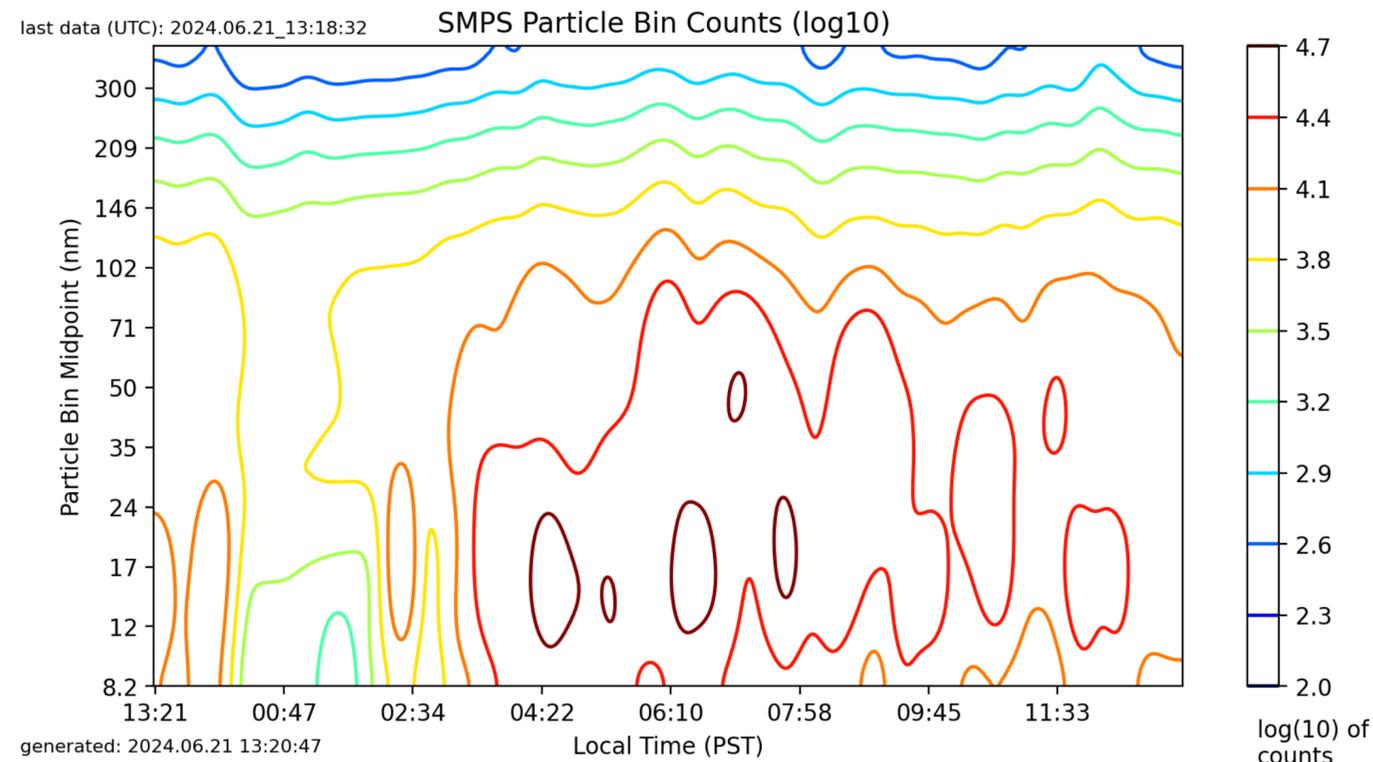
Overall, more ultrafines from the roadways

Air traffic also contributed to “Ultra-ultrafines”  
(10–20 nm diameter)

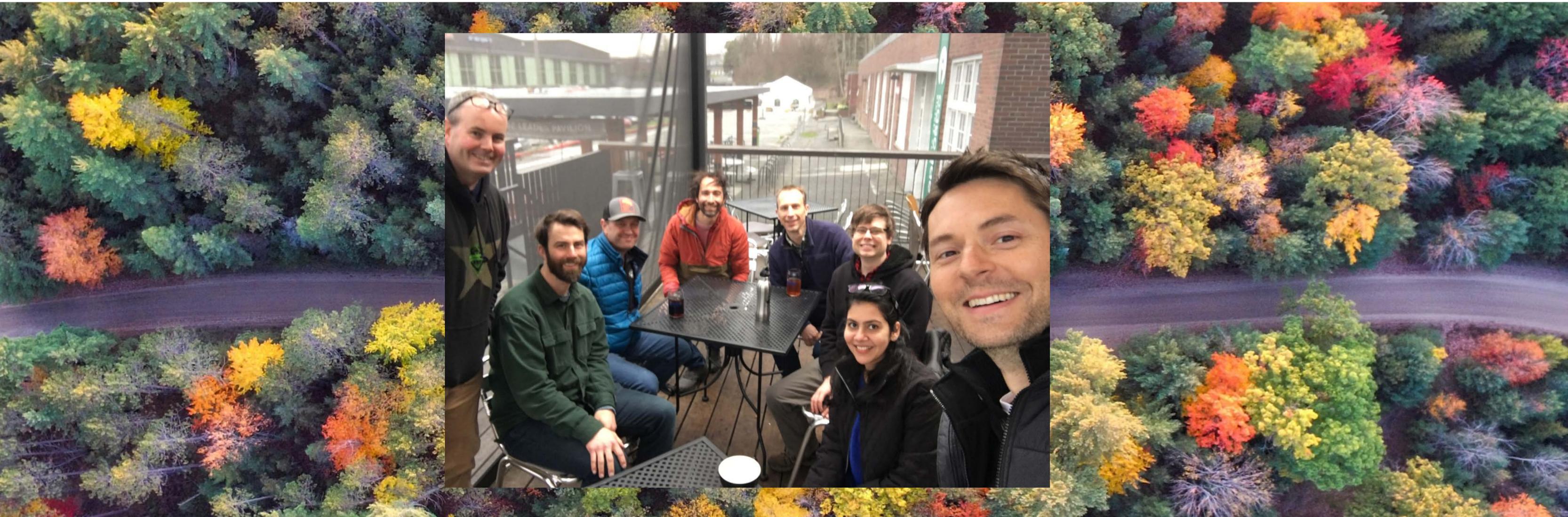
☆ = Our proposed monitoring locations

# Routine ultrafine particle monitoring

Starting to look at different ways to store and display the data



# Many thanks for your attention!



## Questions?